SPECIFICATION

o Amend paragraph beginning at page 16, line 28, as follows:

Referring to FIG. 6, the complex (FIR) signal (sample stream from forward filter 501) is applied to phase rotator 601. Phase rotator 601 operates on the complex (I and Q) components, denoted $y_n(\theta)=I_n(\theta) + jQ_n(\theta)$, and translates the samples to baseband by computing the product $y_n(\theta)e^{-j\theta[n]}$, where $\theta[n]$ is an estimate at discrete time n of the carrier phase error (offset angle θ). The rotated signal is ~~added~~ combined with the output of the feedback filter 505 by real combiner 602. The output signal of combiner 602 is applied to decision device 504, which maps the output signal to the nearest alphabet symbol. When switch 603 is in position #1, the input to feedback filter 505 is the output of combiner 602 (e.g., when implementing a linear equalizer). When switch 603 is in position #2, the input to feedback filter 505 is the output of decision device 504 (e.g., when implementing a DFE).

o Amend paragraph beginning at page 17, line 8, as follows:

Carrier tracking loop 503 receives either the output decisions of decision device 504 (e.g., the output symbol of the slicer), the output signal from combiner 602, or the output of the phase rotator 601, depending on ~~which~~ <u>the</u> mode of operation. Modes of operation include decision-directed (DD) and blind (using SA-CMA phase detection as described herein) modes. For DD mode carrier phase estimation, carrier tracking loop 503 receives both the signal from combiner 602 and output decisions of decision device 504, and from these inputs generates the estimate for angle θ. For blind mode carrier phase estimation, carrier tracking loop 503 includes a blind phase detector to calculate the value for carrier phase error given in equation (7), which value is then (approximately) integrated to give the output angle θ.

o Amend paragraph beginning at page 17, line 17, as follows:

Embodiments of the present invention operating in the baseband such as shown in FIG. 6 may generate an estimate of $\theta[n]$ using one of at least three baseband configurations. In a first exemplary configuration of FECL module 502a, carrier tracking loop 503 generates an estimate of $\theta[n]$ based on the input $\mathrm{Re}\{y_n(\theta)e^{-j\theta[n]}\}$ provided by the I component output from phase rotator 601. In a second exemplary configuration of FECL module 502, carrier tracking loop 503 generates an estimate of $\theta[n]$ based on the input $\mathrm{Re}\{y_n(\theta)e^{-j\theta[n]} - w[n]\}$, where w[n] is the output of the feedback filter. In this second exemplary configuration, carrier phase correction is based on the I component output from combiner 602. In a third exemplary configuration of FECL module 502, carrier tracking loop 503 generates an estimate of $\theta[n]$ based on the output of decision device 504 and combiner <u>602</u>.

o Amend paragraph beginning at page 18, line 28, as follows:

For the second configuration of FECL module 502a shown in FIG. 6, the data signal is the output signal from combiner 602. The phase error term $e_{SA\text{-}CM}[n]$ of SA-CM detector 801 is computed with the data signal $y_n(\theta)e^{-j\theta[n]}$-w[n]. The contribution ~~D[n]~~ <u>DT[n]</u> is same as that in equation (9) given for the first configuration.

o Amend paragraph beginning at page 19, line 27, as follows:

Phase de-rotator 701 and phase re-rotator 702 receive an estimate of θ[n] from carrier tracking loop 503, where θ[n] is an estimate at discrete time n of the phase offset. Phase de-rotator 701 operates on equalized complex (I and Q) components denoted $y_n(\theta)=I_n(\theta) + jQ_n(\theta)$, and computes the product $y_n(\theta)e^{-j\theta[n]}$. Decision device 504 maps I and Q components of $\cancel{y_n(\theta)e^{-j\theta[n]}}$ $\underline{y_n(\theta)e^{-j\theta[n]}}$ to the nearest symbol d[n]. The symbol d[n] from decision device 504 is applied to phase re-rotater 702, which computes the product $d[n]e^{+j\theta[n]}$. Thus, for DFE operation, the feedback signal from feedback filter 505 is re-rotated to align in phase with the output signal from forward filter 501.

o Amend paragraph beginning at page 20, line 25, as follows:

FIG. 9 shows an exemplary implementation for portion 807 of carrier tracking loop 503 operating in accordance with the first configuration of FECL module 502a of FIG. 6. At discrete time n, SA-CM phase detector 801 operates on the previous estimate of θ[n-1] and on the inputs $Re\{y_n(\theta)\}$ and $Im\{y_n(\theta)\}$. The signal $Re\{y_n[\theta]\}$ is used to ~~computed~~ $\underline{\text{compute}}$ $e_{SA\text{-}CM}[n]$ by squaring $Re\{y_n(\theta)\}$, subtracting ρ^2 and multiplying the difference by $Re\{y_n(\theta)\}$. The signal DT[n] is formed by i) multiplying the sine of θ[n-1] with $Re\{y_n(\theta)\}$, ii) multiplying the cosine of θ[n-1] with $Im\{y_n(\theta)\}$, and iii) adding the two intermediary products of i) and ii). The phase detector signal is formed by multiplying $e_{SA\text{-}CM}[n]$ with DT[n] to drive loop filter 802. Samples at discrete time (n-1) are employed in the calculation of DT[n] to specify that the current value of θ[n] is derived from the previous estimate of θ[n-1].